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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/446,738	02/18/2000	YUVAL COHEN	B-3833PCT617	2829

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EXAMINER
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GRAHAM, ANDREW R

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 01/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/446,738	<b>Applicant(s)</b> COHEN ET AL.	
	<b>Examiner</b> Andrew Graham	<b>Art Unit</b> 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,9,11,15,22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,9,11,15,22 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 2644

## **DETAILED ACTION**

### ***Drawings***

The drawings were received on July 12, 2004. These drawings are approved and have been entered into the case.

### ***Response to Arguments***

Applicant's arguments filed July 9, with respect to Claims 1, 9, 22 have been fully considered and are persuasive. The reference of Ishikawa discloses the processing of an audible frequency range signal through branches, which does not meet nor make obvious in view of Neumann or other found prior art, the limitation of "provide ultrasound signals through front and rear channels" as recited in each of these claims, when said limitation taken in consideration with each of the other limitations recited in the claims. Accordingly, the rejection of Claims 1, 9, and 22 in view of Neumann and Ishikawa has been withdrawn.

Applicant's arguments with respect to claims 11, 15, and 23 have been considered but are moot in view of a new ground of rejection.

### ***Claim Objections***

**Claims 11 and 15** are objected to because of the following informalities:

**Claim 11** recites the limitation "perceived by one said ears" in the seventh line of the claim. It appears that this phrase should

Art Unit: 2644

read "perceived by one of said ears". Appropriate correction is required.

Claim 15 includes a period (.) in the thirteenth line of the claim on page 5, "channels.", before the end of the claim.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 11, 15, and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 11 is rejected based on the limitation of "processing arrival times of said ultrasound reference signal at each said ear . . . to measure a distance between the two ears of a user". The claim recites sending "an ultrasound reference signal", understood to be a single reference signal, and processing the reference signal at each said ear, the number of which is disclosed in the claim as being two. This concept finds support from the specification as follows:

Art Unit: 2644

on page 17, lines 17-21:

"In order to process the signals, ultrasound transducer 26 (Fig. 5) sends an ultrasound reference signal to ultrasound microphones 50 and 52 (Fig. 7). A head angle calculator 120 processes arrival times of the ultrasound reference signal at each ear, so as to measure a phase difference of the reference signal as perceived by one ear in contrast to the other ear, as described hereinabove."

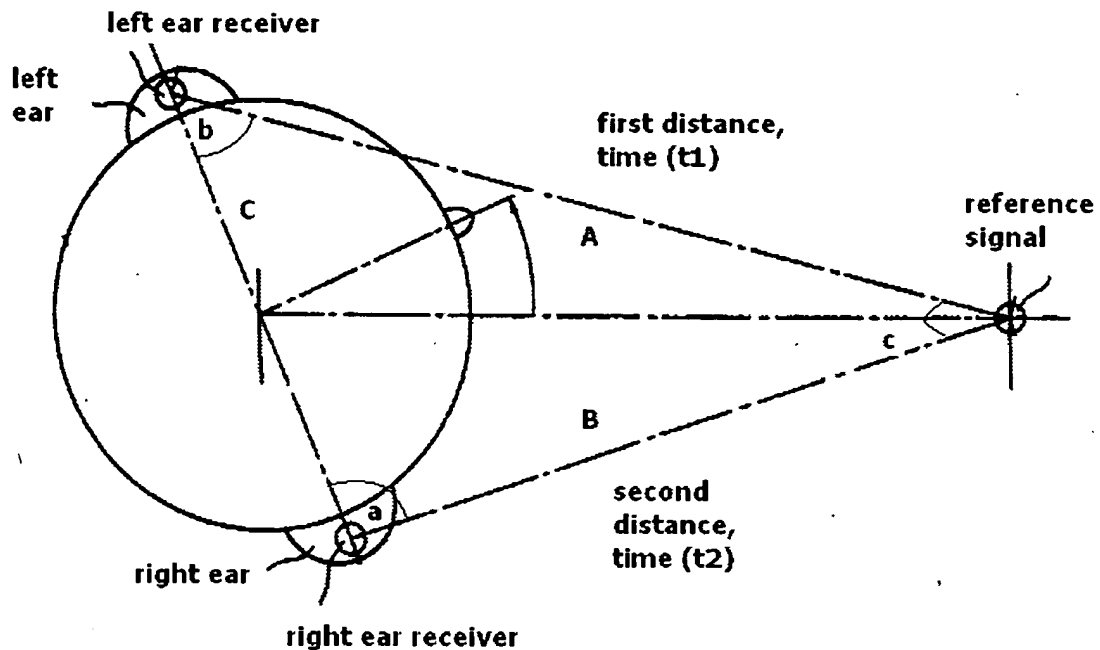
on page 18, lines 25-29:

"The prior art cannot measure distance between ears of the listener. This is a particularly important drawback because not every listener has the same size head and so the sound effects are different for each user. In contrast, the present invention does indeed measure the distance between the two ears of the user and modifies the audio input to the two ears accordingly, as described hereinabove".

However, this disclosure does not enable one of ordinary skill in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, as is further explained hereinbelow.

The general structure specified by the claims, as is supported by the specification is understood to be:

Art Unit: 2644



The specification states that the arrival times ( $t_1, t_2$ ) are processed to determine a phase difference (difference in terms of signal cycle of signals) so as to measure the distance (C) between a user's ears. The manner in which this is performed is not disclosed.

A related reference of Inanaga (EP 0438281 b1) utilizes the knowledge of the time of the emission of the reference signal to determine a distance to a user, based on the measured travel times of the reference signal to the two ears and an assumed sound velocity (col. 6, lines 10-28). This enables sides (A) and (B) of the triangle shown above between the ears and reference source to be known. As noted by the applicant, this does not allow a distance between the ears to be determined. The reason for this can be discerned through

Art Unit: 2644

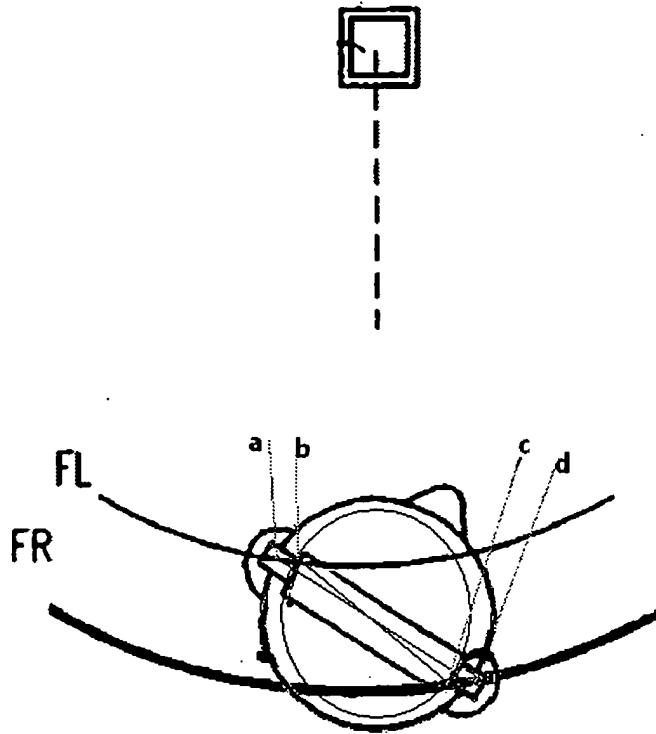
the consideration of relevant rules of trigonometry pertaining to the side lengths and angles of a triangle. The Law of Sines requires a side length, the angle opposite the side length, and the length or angle of the unknown side to determine the angle or length of the unknown side. The Law of Cosines requires, for a unique triangle to be determined, all three side lengths or two side lengths and the angle adjoining the two known side lengths in order for the angles or the remaining unknown side length to be determined. The times and a sound velocity do not present the system of Inanaga with an angle or the means for calculating an angle.

However, the reference of Inanaga is able to determine a relevant angle of orientation through the use of a value for a radius of the user's head, as is shown in the equation that determines the angular orientation of a user's head (col. 6, lines 39-54). The source of this radius value is not disclosed.

This radius is important because the same sets travel distances, and hence signal travel times, may correlate to different angular orientations of different sizes of heads. For example, as generally shown in the figure below, a smaller width of a user's head (inner circle) correlates to the same radius or travel distance of sound (along lines FL,FR), but reaches the ears of the user at a different angular orientation, as indicated by the angular difference between the lines between points (a) and (d) (larger head) and the line between points (b) and (c). For larger head diameters, the reception

Art Unit: 2644

angle of this sound source would appear closer to perpendicular to the axis between the ears of a user in the illustration below.



Regarding the present application, only the arrival times are disclosed as the source of the processing of the measured distance. This is less information than present in the system of Inanaga, yet greater function is claimed. Phase differences would present interaural time difference, as is known in the art to relate to direction, but this measurement, alone, does not present enough information for the width of the space between the two receivers to be determined. It is the function or derivation of this greater function that is not considered enabled in the present application to allow one



Art Unit: 2644

of ordinary skill in the art to make the present application, as currently claimed.

Appropriate correction or clarification is required.

Claim 15 depends on Claim 11, and for that reason is also considered non-enabled. Claim 15 also recites the limitation "measuring the distance between the ears of the user", and is rejected on at least the same grounds as listed above for Claim 11.

Claim 23 also recites the limitation of "measuring a distance"; all measuring listed on the present application is performed in the manner discussed above in regards to Claim 11, and is considered not enabled and rejected based upon the same grounds listed above.

***Claim Rejections - 35 USC § 112 - 2<sup>nd</sup> paragraph***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Amendments made in the reply of July 12, 2004 in regards to the previous rejection of Claim 24 are acknowledged and said previous rejection is hereby withdrawn.

Claims 1, 11, 15, and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 2644

Claims 1, 15, and 22 recite the limitation "wherein said rear channel is accompanied". However, the prior reference to rear channels is made in regards to at least two receivers providing signals through front and rear channels, which suggests at least a front and a rear channel being associated with each receiver. Accordingly, there is insufficient antecedent basis for the reference to "said rear channel" in the claim. Suggested corrections include "wherein each said rear channel is" or "wherein said rear channels are each", in order to clearly recite the correlation between the references to the rear channels.

Claim 11 recites the limitations "the right receiver" and "the left receiver" in the thirteenth and fifteenth lines of the claim. As no receivers are previously noted in the claim, there is insufficient antecedent basis for these limitations in the claim.

#### ***Allowable Subject Matter***

Claims 1, 9, and 22 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

As noted above, Claims 1, 9, and 22 are allowable over the prior art of record because the Examiner found neither prior art cited in its entirety, nor based on the prior art, any motivation to combine any of said prior art to arrive at the limitation(s) of at least

Art Unit: 2644

providing received ultrasound signals through front and rear channels to the right and left ears of a user, as defined in the independent claims, when such a limitation is considered in combination with each of the other limitations, including the physical structures, recited in the claims. Claim 9 is dependent upon Claim 22 and thus includes the limitations of the independent claim and is allowable for the same reason.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sakata (JP 61232795 A) discloses a headset that uses two sets of frequency tuned ultrasonic receivers to receive a left and right audio signal at each ear of a user.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 703-308-6729. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2644

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AC  
Andrew Graham  
Examiner  
A.U. 2644

ag  
December 13, 2004

  
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PRIMARY EXAMINER